

Health literacy: how essential for accessing and utilizing healthcare?

Thesis Based On Existing Data: Social Policy and Public Health (201800155)

Rubin ten Broeke (3934748)

Supervisor: John de Wit

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Abstract

In this thesis, health literacy has been examined in relation to migration background using an existing theoretical framework, in which is stated that health literacy is related to access and use of healthcare (operationalized as health actions and needs). Data from the ‘Gezondheidspeiling 2014’ of the Municipality of Utrecht were used to examine if health literacy could explain (e.g. mediate) the association between migration background and health actions and needs. It was found that people with a migration background overall had (slightly) lower health literacy and (slightly) more health actions and needs. However, this thesis did not show convincing evidence for mediation by health literacy of the association between migration background and health actions and needs. Although mediation effects were found, these were probably not relevant because of the high statistical power of this study. This thesis concludes that health literacy remains a relevant theme because people with a migration background tended to have lower health literacy and more unfulfilled health needs. However, the Municipality of Utrecht should also examine other processes that play a role in the association between migration background and health actions and needs because health literacy only played a minor mediating role.

Introduction

Immigration can have long-term challenges for both host-society members and people with a migration background. Integration in particular often proves to be a long and sometimes problematic process, especially if policy focusses on one-sided assimilation as this can contribute to different groups living parallel and separate lives within society (Ng & Bloemraad, 2015). Moreover, people with a migration background often have to deal with many challenges, among which accessing the healthcare system (Levin-Zamir, Leung, Dodson, & Rowlands, 2017). This is because people with a migration background are often faced with cultural differences (e.g. in patient-practitioner relationship), language barriers and communication problems in the healthcare system (Levin-Zamir et al., 2017). Having sufficient health literacy is crucial to overcome communication and cultural barriers as they give individuals the ability to access, use and understand health information (United Nations Economic and Social Council, 2010).

The Netherlands has the lowest number of people with insufficient health literacy compared to Spain, Bulgaria, Austria, Germany, Greece, Ireland and Poland (Sørensen et al., 2015). Insufficient health literacy nonetheless remains relevant in The Netherlands because three out of ten Dutch citizens report having problems finding, understanding, assessing and/or applying health information (Rademakers, 2014). More importantly, there is an increasing and sometimes exclusive focus of Dutch politicians and policymakers on the own responsibility of citizens (Rademakers 2014; Wetenschappelijke Raad voor het Regeringsbeleid, 2017). Research suggests that people with low health literacy in particular struggle to cope with the focus on own responsibility in the healthcare system (Rademakers, 2014) and that people with a migration background especially tend to have limited health literacy (Kreps & Sparks, 2008; Levin-Zamir et al., 2017). Moreover, in addition to generally having a lower socio-economic status which can be a barrier for utilizing

healthcare, people with a (recent) migration background also struggle to understand their healthcare rights within an unfamiliar environment (Seibel, 2019). In this research, more insight will therefore be gained into the extent to which migration background plays a role for the health literacy of Utrecht citizens and to what extent health literacy can explain peoples' access to and use of healthcare.

Overview of Empirical Research

People with a migration background generally possess better health when they enter their country of destination compared to host society members (Leonhardt, Aschenbrenner, Kreis & Lauscher, 2018). The healthy-migrant-effect explains this by arguing that only healthy people are able to migrate, while unhealthier individuals find themselves less able to move to another country (Leonhardt, et al., 2018). However, over time their health status becomes (more) similar to that of the host society (Cunningham, Ruben & Narayan, 2008; Maneze et al., 2016). This can be explained by a change in lifestyle because people with a (recent) migration background from low-income countries often change their healthier traditional eating habits to more calorie-rich unhealthier diets, resulting in high obesity and overweight rates (Rechel, Mladovsky, Ingleby, Mackenbach & McKee, 2013). Other explanations are poorer access to healthcare than the majority population, seeking less medical assistance resulting in worsened health conditions and a lack of health insurance (Cunningham et al., 2008). Furthermore, certain health-seeking behaviours like screenings are performed less by people with a migration background, mainly because of cultural differences as prevention is not common practice in their country of origin (Levin-Zamir et al., 2017). Health literacy can be helpful in overcoming cultural differences, as having sufficient health literacy improves access to healthcare for people with a migration

background (Levin-Zamir et al., 2017; Van der Heide, Heijmans, Schuit, Uiters & Rademakers, 2015).

Health Literacy. Health literacy is not only about having basic reading skills or knowing how to make an appointment with a General Practitioner (GP); it is also about the degree to which individuals have the skills, confidence and knowledge to make appropriate health decisions using basic health information and services (Von Wagner, Steptoe, Wolf & Wardle, 2009b). Furthermore, health literacy is a dynamic construct and part of an ever-changing social context, influenced by individual as well as external factors (Von Wagner et al., 2009b). Individual factors that may influence peoples' health literacy are for example pre-existing knowledge and cognitive abilities (Von Wagner et al., 2009b). External influences that play a role in the development and maintenance of health literacy are for example the opportunities for formal education and employment status (Von Wagner et al. (2009b). Low health literacy can be an important barrier for access to healthcare and is related with negative health outcomes, including high risk of hospitalization and poor general health status (Levin-Zamir et al., 2017; Von Wagner et al., 2009b). However, if people have higher health literacy this can contribute to lower peoples' barriers for health-seeking behaviours like preventive screenings (Von Wagner, Semmler, Good & Wardle, 2009a). People with a migration background in particular tend to have lower health literacy because of language barriers and cultural differences (Kreps & Sparks, 2008; Levin-Zamir et al., 2017).

Three types of health literacy are distinguished in research. Functional health literacy is about the most basic skills, including reading and writing skills; interactive health literacy is about the social skills that allow people to actively participate in healthcare, and critical health literacy is about the ability to analyse and use information in a critical way to

participate in actions that contribute to a better health (Van der Heide et al., 2015). In this thesis the focus will be on functional health literacy because it is the foundation of health literacy upon which additional skills (e.g. interactive and critical health literacy skills) can be built (Nutbeam, 2008). Furthermore, having sufficient functional health literacy is crucial as it is needed in many common health situations (e.g. reading health information) (Nutbeam, 2008). To get more understanding of the relationship between health literacy, health actions and health outcomes, a theoretical framework is presented.

Theoretical Framework

Paasche-Orlow and Wolf (2007) argue that, to understand the relationship between health literacy and health outcomes (e.g. general health status), health actions should be considered as they play a central (mediating) role in this relationship. Health actions are means through which individuals can prevent diseases, improve their health or adhere to diagnosis and treatment (Paasche-Orlow & Wolf, 2007). In their study, Paasche-Orlow and Wolf (2007) mention three types of health actions: access and use of healthcare, patient-provider interaction and management of health and illness. Within this thesis, access and use of healthcare will be considered, as it is the only health action that has been measured sufficiently in the questionnaire as further described in the methods section. Von Wagner et al. (2009b) also consider the importance of health actions as mediating pathways of the relationship between health literacy and health outcomes. In accordance to the study of Paasche-Orlow and Wolf (2007), Von Wagner et al. (2009b) claim that the extent to which people undertake health actions is not only defined by patient factors (e.g. perceived barriers) but also by system factors (e.g. complexity of the healthcare system).

However, within their framework, Von Wagner et al. (2009b) make some additions to the latter study of Paasche-Orlow and Wolf (2007). Most importantly, Von Wagner et al.

(2009b) add that motivational processes are crucial because they describe the interaction between health literacy and social cognition variables (e.g. health-related knowledge). This interaction can help explain why an individual chooses (not) to undertake health actions (see Figure 1). Within these motivational processes, the Health Belief Model (HBM) plays an important role (Von Wagner et al., 2009b). The emphasis of HBM is on how an individual thinks about a specific disease he or she is trying to treat or prevent. It is assumed that 'motivated individuals' who perceive fewer barriers to undertake certain health behaviour are more likely to undertake health actions (Von Wagner et al., 2009b). Additionally, the Theory of Planned Behaviour (TPB) plays an equally crucial role in the motivational phase of the framework. However, the TPB considers the attitudes and self-efficacy of a person towards a health action more important: if an individual perceives greater behavioural control they would be more likely to undertake health actions (Von Wagner et al., 2009b). Furthermore, Von Wagner et al. (2009b) argue that the implementation skills an individual has are also important (Volitional Phase or Action Control). These skills are about the extent to which an individual is capable of actually undertaking health actions.

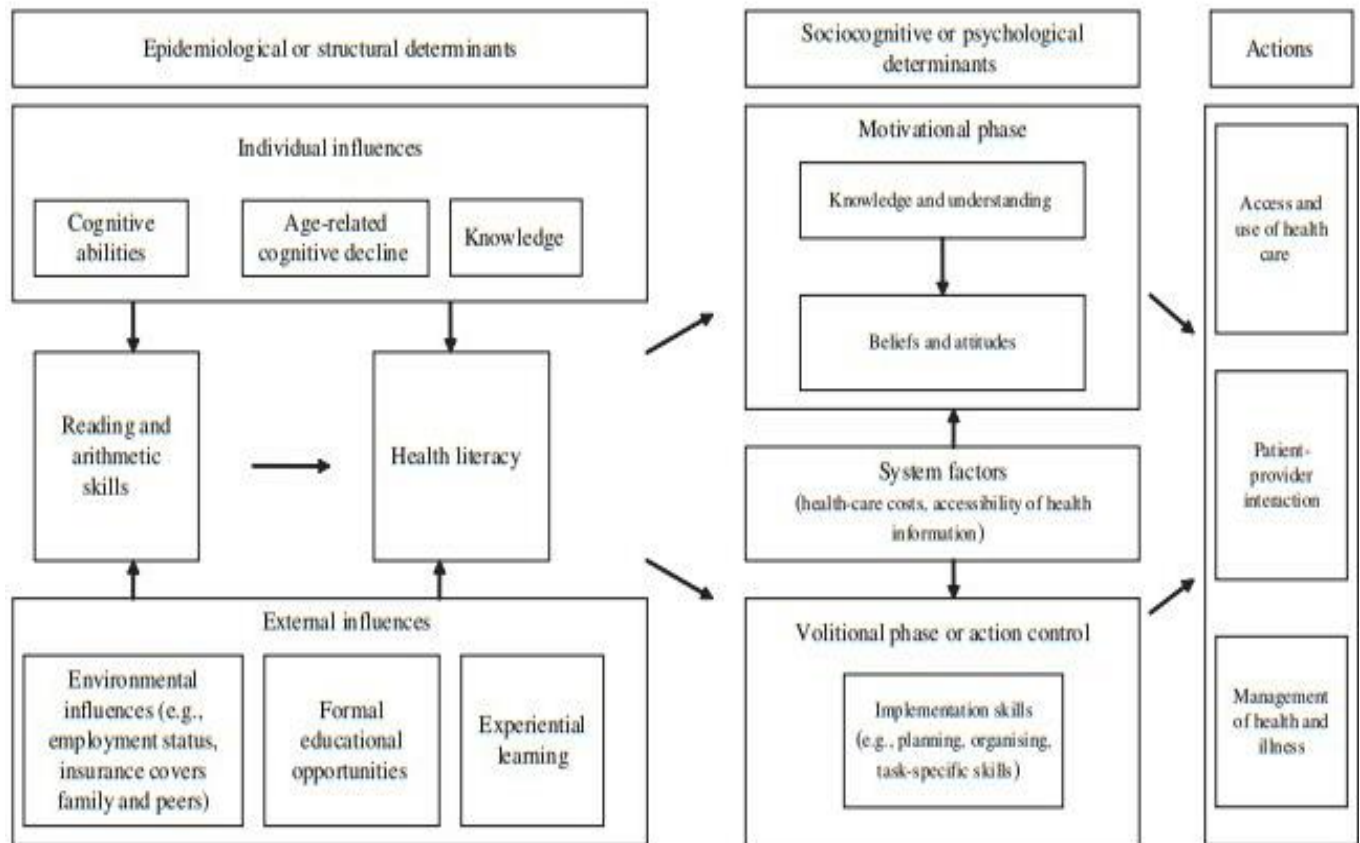


Figure 1. Framework health literacy and health actions. Reprinted from Health literacy and health actions: a review and a framework from health psychology, by Von Wagner et al., 2009b, *Health Education and Behavior*, 36, p. 863.

Evidence Supporting the Theoretical Framework

The theoretical framework as described by Von Wagner et al. (2009b) has not been tested directly in research. However, one relevant study has tested the relationship between health literacy, socio-cognitive or psychological determinants (knowledge), health actions (self-care) and health outcomes (subjective health). The study found that limited health literacy was directly related to poor knowledge of hypertension and that self-care behaviour (e.g. management of health and illness) was directly related to subjective health (Osborn, Paasche-Orlow, Bailey & Wolf, 2011). Nevertheless, there was no direct relationship

between knowledge and self-care (Osborn et al., 2011) as would be expected on the basis of Von Wagner et al.'s (2009b) framework.

Other research supports the relationship between health literacy and health actions. One study found that health needs tend to be higher for people with lower health literacy (Parker & Gazmararian, 2003). This indicates that individuals with limited health literacy have more trouble accessing healthcare. Furthermore, research found that (re)hospitalization and use of emergency rooms has been shown to be higher amongst people with limited health literacy, whilst the use of prevention services was lower (Paasche-Orlow & Wolf, 2007; Von Wagner et al., 2009a). Interestingly, other research conducted in The Netherlands found that people with limited functional health literacy visit their GP more often (Van der Heide et al., 2015). The findings of these studies nuance the model because people with limited health literacy do not necessarily undertake less health actions. Rather, they undertake more health actions in one place (e.g. visit their GP) and less in the other (e.g. visit prevention services). An explanation for this can be given through peoples' navigational skills within the healthcare system. These are skills to find the right place within the healthcare system to solve or prevent (future) health issues (Paasche-Orlow & Wolf, 2007). Navigational skills tend to be lower for people with more limited health literacy (Paasche-Orlow & Wolf, 2007). This indicates that people with limited health literacy have more trouble finding the right healthcare facilities to for example prevent diseases, but that they may have less trouble accessing primary care from a GP.

Because this thesis focuses on people with a migration background in particular, some other relevant research is worth mentioning. It should however first be noted that it is beyond the scope of this study to examine differences between different migration backgrounds. Rather, this study will focus on differences between people with and without a migration

background in regards to their health literacy and their access and use of healthcare. In the methods section of this study, migration background is operationalized.

People with a migration background tend to have higher and more complicated needs for healthcare (Stronks, Ravelli & Reijneveld, 2001). This finding is supported by a recent study conducted in Utrecht: health needs are higher for people with a lower socioeconomic status among whom many people with a migration background (Kringos, Van den Broeke, Van der Lee, Plochg & Stronks, 2016). Moreover, people with a migration background are more likely to seek out for medical help when it is not necessary (Mantwill & Schulz, 2017). Another study conducted in The Netherlands found that the amount of GP-visits among people with a migration background was 33% higher than amongst the majority population (Van der Gaag, Van der Heide, Spreeuwenberg, Brabers & Rademakers, 2017). Two other studies support the finding that people with a migration background have more contact with GP's and less often attend prevention and screening programs (Nørredam, Nielsen & Krasnik, 2010; Uiters, Dévillé, Foets, Spreeuwenberg & Groenewegen, 2009). Although research shows evidence for a relationship between migration background and access and use of healthcare, it remains the question to what extent health literacy plays a role in this relationship.

Research Question and Hypotheses

This study will examine to what extent health literacy plays a (mediating) role in the relationship between migration background and access and use of healthcare. This research will not only look at healthcare utilization but also at health needs because these tend to be higher if people have limited health literacy (Parker & Gazmararian, 2003). Therefore, this thesis will examine utilization of healthcare and the unfulfilled care needs people have (e.g. access and use of healthcare). The main question is: 'Are there differences in health actions

and needs between people with and without migration background and can these differences be explained by differences in health literacy?’

People with a migration background tend to utilize certain primary care services more (Nørredam, et al., 2010; Uiters et al., 2009), even when it is not necessary (Mantwill & Schulz, 2017). Furthermore, people with a migration background visit their GP more often (Van der Gaag et al., 2017) (e.g. undertake more health actions), indicating they may also have more contact with their GP. In addition, individuals with a migration background experience more barriers to access the healthcare system (Levin-Zamir et al., 2017; Rechel et al., 2013), which may result in having more health needs (Stronks et al., 2001; Kringos et al., 2016). Therefore, it is hypothesized that people with a migration background undertake more health actions and have more health needs.

Moreover, previous research found that people with a migration background experience more communication problems and have lower arithmetic, writing and reading skills (Kreps & Sparks, 2008; Levin-Zamir et al., 2017). Because the latter skills are crucial for having sufficient functional health literacy (Van der Heide et al., 2015), it is hypothesized that functional health literacy is lower for people with a migration background.

As stated before, it is expected that people with a migration background have more health actions and needs. Sufficient health literacy plays a crucial role for people to access and use healthcare (Levin-Zamir et al., 2017; Van der Heide et al., 2015). Therefore it is hypothesized that the association between migration background and health actions and needs is mediated by health literacy; if people have a migration background they will have more health actions and needs which is explained by having lower health literacy. A visualization of the expected mediation-effect is shown in Figure 2.

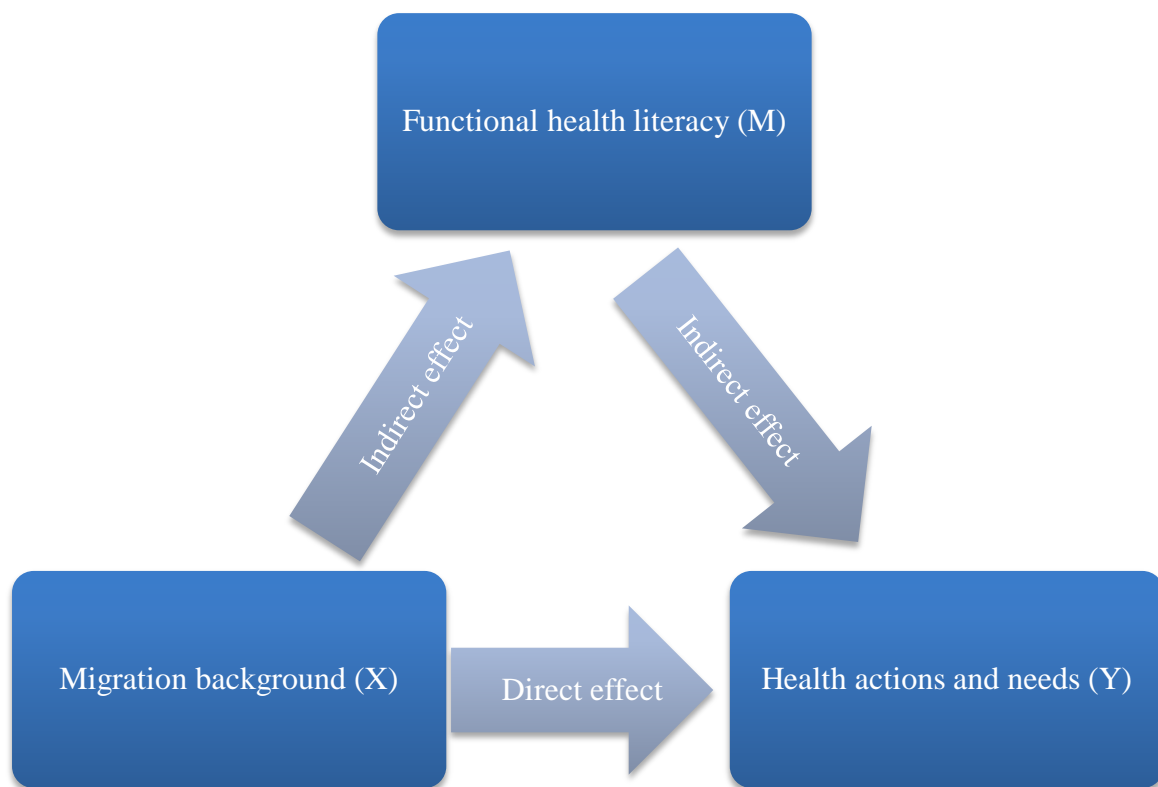


Figure 2. Visualization of the mediation effect as described in hypothesis 3

Methods

To study the relationship between migration background, health literacy and health actions and needs, a quantitative research design has been chosen. A database will be used consisting of data gathered in the ‘Utrechtse Gezondheidspeiling 2014’ which is undertaken every two years by the Municipality of Utrecht. The ‘Utrechtse Gezondheidspeiling 2014’ has been fielded by researchers of the ‘Gemeentelijke Gezondheidsdienst’ (GGD). The results of the ‘Gezondheidspeiling’ are used for the ‘Volksgezondheidsmonitor’ (Gemeente Utrecht, 2014). The ‘Gezondheidspeiling 2014’ aimed to gather data regarding the health, lifestyle and skills, social environment, use of care, societal participation and physical living environment of Utrecht citizens (Gemeente Utrecht, 2014). The questionnaire for the

‘Utrechtse Gezondheids peiling’ could be filled in offline and online. Respondents who completed the questionnaire online received computer-tailored health advice.

Sample and Recruitment

For the ‘Gezondheidspeiling’, a stratified random sample of 8841 residents aged 19 and over from all ten districts of Utrecht was drawn from the ‘Basisregistratie Personen’ (BRP). Deprived areas within four of the districts were oversampled to ensure a sufficient number of respondents from all subpopulations. People were sent an invitation letter with a personal access-code and instructions for the web-based questionnaire. Most people were 19 to 64 years old ($n = 7774$) and a smaller group was 65 years and older ($n = 1067$). Those who did not respond or did not have access to the internet were sent a physical questionnaire to their address after two weeks. If people did not respond, reminders were sent after another three to six weeks. Additionally, in deprived areas adults were called or visited at home to maximize response. A similar method was used for non-respondents with a Turkish or Moroccan background. As an incentive for participation, ten respondents were eligible to win a gift of €100 - each raffled amongst all participants. The response rate among adults was 37% for the group of 19-64 year olds and 60% for the group of 65+ year olds. The overall response rate was 40%, resulting in a sample of 3538 respondents.

The sample is not representative for the population of Utrecht because of selective response. Therefore data were weighted (‘balanced’) to reduce bias due to overrepresentation and underrepresentation. This has as downfall that it is assumed that those participating in the study do not have different outcomes than those who did not participate. See Table 1 for sociodemographic characteristics of the respondents.

Table 1

Sociodemographic Characteristics of the Sample

	Frequency	Percentage
Gender		
Male	1509	42.7
Female	2029	57.3
Age		
19-39	1617	45.9
39-65	1249	35.5
65+	654	18.6
Education		
Low	271	7.9
Middle	1372	39.9
High	1797	52.2
Migration background		
No migration background	2662	76.1
Migration background	837	23.9
Experienced health		
(Very) good	2939	83.6
Moderate or bad	578	16.4

Researchers from the Municipality of Utrecht acted according to the privacy and confidentiality codes from 'The Department for Statistics and Research' (Gemeente Utrecht, n.d.). Before the database was accessed, an agreement was signed with the Municipality of Utrecht, the supervisor from Utrecht University and me in which was agreed that the database would be handled carefully and confidentially. Storing and archiving the database was done in compliance with the ethical rules set for the Master Social Policy and Public Health. Furthermore, measures were taken by the Municipality of Utrecht to send the database through a safe environment ('M-Safe').

Operationalization and Measurement

Access and use of healthcare is the only category measured under ‘health actions and needs’; the other two types of health actions from the framework of Von Wagner et al. (2009b) – management of health and illness and patient-provider interaction – have not been measured sufficiently. The four variables that will be considered for these health actions and needs are:

- Whether respondents have had contact with their GP in the previous year: ‘No’ (1) or ‘Yes’ (2);
- Whether respondents needed medical or dentist treatment but had not received it: ‘No’ (1) or ‘Yes’ (2);
- Whether respondents needed more help with domestic tasks because of health-issues or old age: ‘No’ (1) or ‘Yes’ (2);
- Whether respondents needed more help for personal care because of health-issues or old age: ‘No’ (1) or ‘Yes’ (2).

Contact with a GP (health action) was used because of empirical evidence that people with migration background are more likely to contact their GP. Using the other three items (health needs) as dependent variables assumes that respondents who need medical treatment or additional help with domestic tasks or personal care, because of health-issues or old age, have trouble accessing and using healthcare. Two health needs still had to be made dichotomous for data analyses (‘more need for personal care’ and ‘more need for help with domestic tasks’).

Health Literacy. For the independent variable ‘functional health literacy’ three items were used from a validated health literacy questionnaire (Chew, Bradly & Bokyo, 2004) which was designed to identify people with low functional health literacy. A reliability test

was performed of the three items measuring health literacy. This resulted in an acceptable Cronbach's alpha ($\alpha = .797$) (Tavakol & Dennick, 2011). Item analysis showed that alpha would not be meaningfully improved if any of the three items would be removed.

Furthermore, one item was recoded to ensure a higher score meant higher health literacy and all three items were combined into one score. The dependent variable 'health literacy score' was created by calculating the mean score from the three health literacy items. The first item measured how often respondents received help reading letters or documents from their GP, hospital or other care institutes; always (1), often (2), sometimes (3), now and then (4) or never (5). The second item measured how often respondents found it difficult to get to know more about their health as they did not understand the information; always (1), often (2), sometimes (3), now and then (4) or never (5). In the third item it was measured how sure respondents were about filling in medical forms; very sure (5), quite sure (4), a bit sure (3), a little bit sure (2) or not sure at all (1).

Migration Background and Control Variables. To measure the other independent variable, migration background, the Municipality of Utrecht had used information from the aforementioned BRP. To decide whether a person had a migration background the definition of the 'Centraal Bureau voor de Statistiek' ('Begrippen CBS,' 2016) was used. This definition states that for a person to have a migration background, at least one of their parents has to be born abroad. Respondents of whom both parents were born in The Netherlands were added to the group without migration background and respondents of whom one or both parents were born abroad were added to the group with migration background. The most important control variables were education, gender, age, education and experienced health. Additional data-transformations were done for some background

variables to enable more useful interpretation of the data. Age was transformed from five into three categories and education from four into three categories (see Table 1).

Data Analysis

A weight-factor was included based on background-information to make the results better generalizable for all citizens of Utrecht. Despite data cleaning, the weight factor was not available for some cases ($n=7$) because of missing background variables.

The purpose of this study was to test mediation by health literacy of the association between migration background and health actions and needs. In order to test mediation, the approach proposed by Baron and Kenny (1986) was used and adapted to analyse dichotomous outcome variables. To test for multicollinearity, VIF-values were checked; none exceeded 2.5, indicating multicollinearity was not an issue. To test if migration background (independent variable) was associated with health actions and needs (dependent variable), four logistic regression analyses were performed. Each of these analyses controlled for age, gender, education and experienced health. To test if migration background (independent variable) was associated with health literacy (mediator), the non-parametric Mann-Whitney *U*-test was used, since scores were not normally distributed as indicated by the Kolmogorov-Smirnov statistic ($KS=.312, p < .001$). To test if health literacy (mediator) was associated with health actions and needs (dependent variable), logistic regression analyses were performed for each of the health actions and needs controlled for age, gender, education and experienced health. To test if the effect of migration background (independent variable) on health actions and needs (dependent variable) was attenuated by the inclusion of health literacy (mediator), health actions and needs were regressed simultaneously onto migration background and health literacy.

Results

As can be seen in Table 2, participants' mean scores on health literacy were high while respondents reported few health actions and needs. Contact with GP was an exception with most respondents (74.3%) having contacted their GP in the previous year.

Table 2

Scores on Health Literacy and Health Actions and Needs

Variable	Statistics
Health literacy	M= 4.61 (SD= .70)
Health actions and -needs (1 = No, 2 = Yes)	
Contacted GP last year	74.3%
Needing medical treatment but not received	M= 1.07 (SD= .26)
Needing more personal care	M= 1.01 (SD= .12)
Needing more help with domestic tasks	M= 1.04 (SD= .19)

Migration Background and Health Actions and Needs

Detailed results of the four logistic regression analyses are shown in Table 3. A first logistic regression analysis was performed to ascertain the effect of migration background on the likelihood of having had contact with a GP in the last year. This model explained 10.6% of the variance in contact with GP (Nagelkerke $R^2 = 0.106$). People with a migration background were 1.32 times more likely to have contacted their GP in the last year than respondents without migration background. A second logistic regression analysis was performed to ascertain the effect of migration background on the likelihood of needing medical care or dentist treatment whilst not having received it. This logistic regression model explained 9.0% of the variance in needing medical treatment (Nagelkerke $R^2 = 0.090$). People with a migration background were 2.27 times more likely to need medical or dentist treatment whilst not having received it than people without migration background. Third, a

logistic regression analysis was performed to ascertain the effect of migration background on needing more personal care. This logistic regression model explained 34.7% of the variance in needing more personal care (Nagelkerke $R^2 = 0.347$). People with a migration background were 1.05 times more likely to have a need for more personal care than people without migration background. However, this odds ratio was not significant ($p = 0.33$). Because there was no relation between the dependent and independent variable, no further mediation analysis was conducted to test mediation for needing more personal care. Lastly, a logistic regression was performed to ascertain the effect of migration background on needing more help with domestic tasks. This logistic regression model explained 28.7% of the variance (Nagelkerke $R^2 = 0.287$) in needing more help with domestic tasks. People with a migration background were 1.63 times more likely to need more help with domestic tasks.

Table 3

Multivariate Logistic Regression Analysis of the Effect of Migration Background on Health Actions and Needs

Variables	Contacted GP last year Odds ratio (95% Confidence Interval)	<i>P</i> value	Need medical treatment Odds ratio (95% Confidence Interval)	<i>P</i> value	Need more personal care Odds ratio (95% Confidence Interval)	<i>P</i> value	Need more help domestic tasks Odds ratio (95% Confidence Interval)	<i>P</i> value
Migration background								
No migration background	Reference		Reference		Reference		Reference	
With migration background	1.32 (1.29 - 1.35)	< .01	2.27 (2.19 - 2.34)	< .01	1.05 (0.96 - 1.14)	0.33	1.63 (1.55 - 1.72)	< .01
Gender								
Male	Reference		Reference		Reference		Reference	
Female	1.98 (1.94 - 2.01)	< .01	0.88 (0.86 - 0.91)	< .01	1.31 (1.21 - 1.41)	< .01	1.78 (1.70 - 1.87)	< .01
Age								
19-39 year	Reference		Reference		Reference		Reference	
39-65 years	1.10 (1.08 - 1.12)	< .01	1.04 (1.00 - 1.08)	0.06	2.92 (2.50 - 3.42)	< .01	2.48 (2.31 - 2.67)	< .01
65+ years	1.84 (1.78 - 1.90)	< .01	0.81 (0.77 - 0.85)	< .01	4.08 (3.48 - 4.79)	< .01	3.57 (3.30 - 3.87)	< .01
Education								
Low	Reference		Reference		Reference		Reference	
Middle	1.37 (1.30 - 1.43)	< .01	0.90 (0.85 - 0.95)	< .01	0.66 (0.61 - 0.71)	< .01	0.59 (0.55 - 0.62)	< .01
High	1.17 (1.11 - 1.23)	< .01	0.53 (0.50 - 0.57)	< .01	0.20 (0.17 - 0.23)	< .01	0.45 (0.42 - 0.49)	< .01
Experienced health								
(Very) good	Reference		Reference		Reference		Reference	
Moderate or bad	5.70 (5.44 - 5.98)	< .01	3.29 (3.16 - 3.42)	< .01	29.08 (25.76 - 32.82)	< .01	11.66 (11.03 - 12.32)	< .01

Health Literacy, Migration Background and Health Actions and Needs

A Mann-Whitney *U*-test indicated that health literacy scores of respondents with a migration background were significantly lower than scores of respondents without migration background $U = 4396377312.5$, $z = -90.64$ (corrected for ties), $p < .001$. Furthermore, as can be seen in Table 4, there was a significant relationship between health literacy scores (mediator) and each of the three health actions and needs (dependent variables) for which mediation could be tested, controlling for age, gender, education and experienced health. The higher peoples' health literacy score, the lower their likelihood of undertaking health actions and having health needs. For each 'unit' of increase on health literacy, respondents were 0.85 times less likely of having contacted their GP in the previous year, 0.84 times less likely of needing medical or dentist treatment whilst not having received it and 0.63 times less likely of needing more help with domestic tasks.

As can be seen in Table 5, there was still a significant relationship between migration background (independent variable) and each of the three health actions and needs (dependent variables) when controlling for health literacy (mediator). Compared to the effects (e.g. odds ratios) shown before in Table 3, the effects of migration background remained largely unchanged when the hypothesized mediator health literacy was added. Hence, there was no full mediation by health literacy scores of the association between migration background and each of the three health actions and needs. Three separate Sobel tests indicated partial mediation by health literacy of the association between migration background and having contacted a GP last year ($t = 13.71$, $p < .01$), needing medical treatment ($t = 7.51$, $p < .01$) and needing more help with domestic tasks ($t = 32.62$, $p < .01$).

Table 4

Multivariate Logistic Regression Analysis of the Effect of Health Literacy on Health Actions and Needs

Variables	Contacted GP last year		Need medical treatment		Need more help domestic tasks	
	Odds ratio (95% Confidence Interval)	<i>P</i> value	Odds ratio (95% Confidence Interval)	<i>P</i> value	Odds ratio (95% Confidence Interval)	<i>P</i> value
Health literacy score	0.85 (0.84 - 0.87)	< .01	0.84 (0.82 - 0.85)	< .01	0.63 (0.62 - 0.64)	< .01
Gender						
Male	Reference		Reference		Reference	
Female	1.98 (1.95 - 2.01)	< .01	0.88 (0.85 - 0.90)	< .01	1.77 (1.68 - 1.86)	< .01
Age						
19-39 year	Reference		Reference		Reference	
39-65 years	1.10 (1.08 - 1.12)	< .01	0.96 (0.93 - 1.00)	0.04	2.32 (2.16 - 2.50)	< .01
65+ years	1.79 (1.73 - 1.85)	< .01	0.65 (0.62 - 0.68)	< .01	3.02 (2.80 - 3.27)	< .01
Education						
Low	Reference		Reference		Reference	
Middle	1.39 (1.32 - 1.46)	< .01	0.88 (0.83 - 0.93)	< .01	0.76 (0.71 - 0.81)	< .01
High	1.23 (1.17 - 1.29)	< .01	0.52 (0.49 - 0.55)	< .01	0.71 (0.65 - 0.77)	< .01
Experienced health						
(Very) good	Reference		Reference		Reference	
Moderate or bad	5.27 (5.02 - 5.52)	< .01	3.09 (2.96 - 3.21)	< .01	9.46 (8.93 - 10.02)	< .01

Table 5

Multivariate Logistic Regression Analysis of the Effect of Health Literacy on Health Actions and Needs Controlled for Migration Background

Variables	Contacted GP last year		Need medical treatment		Need more help domestic tasks	
	Odds ratio (95% Confidence Interval)	<i>P</i> value	Odds ratio (95% Confidence Interval)	<i>P</i> value	Odds ratio (95% Confidence Interval)	<i>P</i> value
Health literacy score	0.87 (0.85 - 0.89)	< .01	0.92 (0.90 - 0.94)	< .01	0.65 (0.64 - 0.67)	< .01
Migration background						
No migration background	Reference		Reference		Reference	
With migration background	1.27 (1.24 - 1.31)	< .01	2.24 (2.16 - 2.32)	< .01	1.45 (1.37 - 1.54)	< .01
Gender						
Male	Reference		Reference		Reference	
Female	1.98 (1.94 - 2.02)	< .01	0.87 (0.84 - 0.90)	0.11	1.77 (1.68 - 1.86)	< .01
Age						
19-39 year	Reference		Reference		Reference	
39-65 years	1.11 (1.08 - 1.13)	< .01	1.03 (0.99 - 1.07)	0.11	2.54 (2.35 - 2.73)	< .01
65+ years	1.85 (1.79 - 1.91)	< .01	0.82 (0.78 - 0.87)	< .01	3.68 (3.39- 3.99)	< .01
Education						
Low	Reference		Reference		Reference	
Middle	1.51 (1.44 - 1.59)	< .01	0.95 (0.89 - 1.00)	0.06	0.79 (0.74 - 0.85)	< .01
High	1.35 (1.28 - 1.42)	< .01	0.58 (0.55 - 0.62)	< .01	0.77 (0.71 - 0.84)	< .01
Experienced health						
(Very) good	Reference		Reference		Reference	
Moderate or bad	5.40 (5.14 - 5.66)	< .01	3.08 (2.96 - 3.21)	< .01	9.16 (8.65 - 9.71)	< .01

Discussion

In this research it was examined what the differences were between people with and without a migration background in regards to their health actions and needs and whether these differences could be explained by differences in health literacy. The results of this study indicated that people with a migration background had lower health literacy and a higher likelihood of reporting three out of four health actions and needs. However, associations between migration background and health actions and needs were not meaningfully mediated by health literacy.

The findings overall speak in favour of hypothesis 1. People with a migration background had a (slightly) higher likelihood of having contacted their GP and of having two health needs: needing medical or dentist treatment and needing more help with domestic tasks. The hypothesis was however not confirmed for the outcome needing more personal care, as people with a migration background were not (significantly) more likely to need more personal care than those without a migration background. Hypothesis 2 was confirmed because health literacy scores of people with a migration background were significantly lower. However, hypothesis 3 cannot be confirmed as there was no meaningful mediation by health literacy of the association between migration background and health actions and needs. There were significant partial mediation effects found by health literacy of the association between migration background and health actions and needs. However, the significance of these mediation effects can probably be ascribed to the high statistical power of this study (e.g. very big sample). The high statistical power probably caused the relatively small indirect effect of health literacy to be significant, whilst the direct effect of migration background on health actions and needs got only slightly smaller.

Contextualizing Findings Health Literacy and Health Actions and Needs

The results indicate that people with a migration background had (slightly) higher health needs which supports the first hypothesis and is in line with previous research (Kringos et al., 2016). Furthermore, the results indicate that people with a migration background have more trouble accessing the healthcare system because they may have more unfulfilled health needs which is supported by previous research (Levin-Zamir et al., 2017; Nørredam & Krasnik, 2011; Rechel et al., 2013). Contrary to the first hypothesis however, results also indicate that there is no (significant) difference between people with and without migration background in needing more personal care. A possible explanation is that people with a migration background in The Netherlands tend to prefer informal care for (elderly) family members above care provided by healthcare professionals (e.g. ‘personal’ home-care) (Van Wieringen, 2014). Additionally, the results indicate that people with a migration background have more contact with their GP, which is also supported by earlier research (Nørredam, et al., 2010; Uiters et al., 2009; Van der Gaag et al., 2017).

The findings in regards to the second hypothesis are consistent with previous research. Rechel et al. (2013) and Kreps and Sparks (2008) have also found that people with a migration background tend to be more likely to have lower health literacy. A more recent study conducted in The Netherlands has however only found significantly lower health literacy for people with a Turkish migration background, and not for people with other migration backgrounds (Van der Gaag et al., 2017). The results in regards to the second hypothesis further indicate that the observed effect (e.g. difference between the groups) was only small (Allen, Bennet & King, 2010). A possible explanation may be that a substantial part of the participants are second generation migrants who generally have more sufficient health literacy vis-à-vis people from the first generation because of education and work (Levin-Zamir et al., 2017). Of the Utrecht population with a migration background, nearly

half (48%) consists of people from the second generation (Gemeente Utrecht, 2019). Another explanation may be that people with limited health literacy are not well-represented in this study as they tend to be less inclined to fill in a questionnaire (Gemeente Utrecht, 2018).

In regards to the third hypothesis the results show no convincing evidence that health literacy explains differences in health actions and needs between people with and without a migration background. These results contradict research that marks the importance of health literacy for lowering barriers to access and use healthcare (Levin-Zamir et al., 2017; Van der Heide et al., 2015). Contrary to the findings of the study by Van der Heide et al. (2015), the likelihood of having had contact with a GP in the last year was lower when people had higher health literacy. One possible explanation is that this health action has been measured differently in the latter study of Van der Heide et al. (2015) as researchers used ‘visiting a GP’ whilst in the current study ‘contact with a GP’ was used. Possibly people with limited health literacy do not contact their GP more often, but do visit their GP more frequently. However, consistent with previous research, health needs may be lower if people have higher health literacy (Parker & Gazmararian, 2003).

Study Strengths and Limitations

One of the strengths of this study is its external validity; a large dataset has been used for which respondents have been randomly selected. In addition, a weight-factor has been included in the data-analysis, making the results generalizable to all citizens of the city of Utrecht. Furthermore, this study is one of the first to test part of the framework developed by Von Wagner et al. (2009b). Therefore, this study offers a starting point for future research to further examine the association between health literacy, health actions, and health outcomes.

There are also limitations of this study. One of these limitations is that measurement of health literacy consisted of only three items pertaining to measure functional health

literacy. Future studies should measure health literacy more broadly by using the National Assessment of Adult Literacy as it is considered the most extensive tool available (Berkman, Davis & McCormack, 2010). However, the three questions used in this study had sufficient internal consistency and the scale has been proven to have a high predictive value for examining peoples' inadequate functional health literacy (Baker, 2006). Measurement of health actions in the questionnaire has also been limited as this was only measured using contact with a GP. Future studies should expand the measurement of access to healthcare beyond contact with GP's alone (e.g. by adding visiting prevention services or hospitals). Furthermore, future studies can also include indicators of the other two health actions specified in the model by Von Wagner et al. (2009b): patient-provider interaction and management of health and illness.

In addition to measuring health literacy and health actions more extensively, more qualitative research is necessary to put the findings of this study into context (but see Suurmond, Rosenmöller, El Mesbahi, Lamkaddem & Essink-Bot, 2016). In future qualitative research it can be examined how and why people with a migration background may experience more health needs and may have more contact with their GP. In addition, qualitative research can also help to examine how people with a migration background think about health literacy and their access to the healthcare system. After all, culture and context play a vital role for peoples' health literacy because one may be considered to have good health literacy in one culture or context but not in the other (Levin-Zamir et al., 2017).

Conclusion

Although the Municipality of Utrecht already has some interventions in place to ensure everyone has sufficient (health) literacy (e.g. 'Taal Doet Meer'), this study shows that people with a migration background are in general still less health literate. This study thus

emphasizes the importance of continuing or even expanding (health) literacy interventions. However, it has also become clear from this study that health literacy only played a minor mediating role between migration background and health actions and needs. Therefore, this thesis points out that the Municipality of Utrecht should not only look at health literacy to explain the association between migration background and health actions and needs. Other processes in regards to access and use of healthcare have to be examined as well because they may play a more important role. In addition, more qualitative research is necessary to explore how unfulfilled health needs can be lowered and what barriers are yet to be overcome to ensure equal access and utilization of healthcare.

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